

Appl. No. 09/930,536
Amdt. dated September 15, 2003
Amendment under 37 CFR 1.116 Expedited Procedure
Examining Group

PATENT

REMARKS/ARGUMENTS

I. Status of the Claims

Prior to entry of this amendment, claims 19-30 were pending, with claims 19, 20 and 29 withdrawn from consideration as drawn to non-elected subject matter. Upon entry of this amendment, certain claims are amended and claims 19, 20 and 29 canceled without prejudice or disclaimer. Hence, after entry of this amendment, claims 21-28 and 30 are pending.

II. Interviews

The undersigned thanks Examiner Siew for his courtesy in discussing the current claims during phone conversations held on August 27, 2003 and September 3, 2003. The current claim amendments incorporate changes which were discussed and deemed helpful in clarifying the nature of the invention.

III. Amendments to Specification

Amendments to the specification made in the amendment filed June 25, 2003, are resubmitted here because the June 25th amendment was not entered (see Advisory Action mailed July 16, 2003). These amendments were also submitted earlier in a response filed October 17, 2001. However, because these amendments were not incorporated into further amendments to these same paragraphs made on September 13, 2002, they are reintroduced now. These amendments are made simply to incorporate the appropriate sequence identifiers.

IV. Rejection of Claims under 35 U.S.C. 112, Second Paragraph

Claims 21-28 are rejected as being indefinite because claim 21 recites to a first probe that differs between sets yet recites that the first probe is common to all the pools. It is thus concluded that it is unclear whether the first probe is different or the same within the pools.

It is initially noted in response that the rejection applies to claims 24-28; these claims do not depend upon claim 21 nor include the language that is objected to. It is assumed that the

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rejection was intended to be limited to claims 21-23. If this is not the case, clarification is requested. With respect to the merits of the rejection, it is noted that the first probes within the *same* set have the same sequence, whereas first probes in *different* sets have different sequences. Claim 1 has been amended to clarify this.

IV. Rejection of Claims under 35 U.S.C. § 103(a)

Claims 21-28 and 30 stand rejected as obvious over a published PCT application to Satoshi et al. (WO 98/11210) in view of U.S. Patent 6,103,463 to Chetverin et al. (hereinafter "Chetverin"). As an initial matter, Applicants note that the Satoshi PCT publication cited by the Examiner has matured into U.S. Patent 6,225, 056. A copy of this patent was previously provided with the amendment filed on June 25, 2003. This is a more useful document for discussion because it is in English, whereas the PCT reference is in Japanese (with the exception of the abstract).

The Office Action says that Satoshi discusses an array with a first probe that binds to different mismatches at an interrogation site and a second probe that is common to the target sequence and nonoverlapping to the complementary region of the first probe. Chetverin is said to discuss arrays with different probes at different regions. The combined discussion in these two references is said to render the current claims obvious. For the reasons that follow, Applicants respectfully disagree.

A. Claim 21

Arrays described in current claim 21 include the following elements:

1. A plurality of sets of nucleic acid probes, each set including a plurality of probe pools;
2. Each of these probe pools, in turn, includes two types of probes: (i) a first probe that is complementary to a known marker located in a target nucleic acid, and (ii) a second probe that differs in sequence from the first probe; and

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3. The first probes within probe pools that belong to the *same* set have the same sequence; whereas, first probes within probe pools that belong to *different* sets have different sequences.

Satoshi discusses various arrays having one or more pairs of probes. The probes in a pair have base sequences that can sequentially hybridize with a particular target nucleic acid. The probes are chosen such that if the pairs of probes hybridize to the target they can be ligated together. In Figure 3, for instance, Satoshi depicts two probes, a first probe that can hybridize to one segment of a target nucleic acid and a second probe that can hybridize to a second segment of the target nucleic acid. There is no discussion in Satoshi, however, of arrays having all of the foregoing three elements. For instance, Satoshi does not teach or suggest arrays having a plurality of sets of probe pools, with the sets having the particular type of probe pools described in claim 21. There is no discussion, for example, of arrays in which the first probes in those probe pools within a set have the same sequence, whereas first probes within different sets have different sequences. Said differently, there is no indication that the array shown in Fig. 3 describes arrays that include elements 1 or 3' above.

Figure 8 of Satoshi depicts an array in which there is a set of 5 probe pairs. Even if one assumes that these 5 sets of probe pairs constitute a set, there is no indication that the array includes a plurality of such sets as claim 21 requires (see element 1 above). Furthermore, there is no discussion of arrays in which first probes within a probe set have the same sequence, whereas first probes within different sets have different sequences (see element 3). So the probe arrangement shown in Fig. 8 of Satoshi also lacks at least elements 1 and 3.

Chetverin discusses various types of binary arrays. Arrays of this type are characterized by having immobilized oligonucleotides, each oligonucleotide including a constant segment and a variable segment. But there is no discussion in Chetverin to compensate for the deficiencies in disclosure of Satoshi.

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So even when the disclosures of both Satoshi and Chetverin are combined, they fail to teach each and every element of claim 21 as required to establish a prima facie case of obviousness.

B. Claims 24 and 30

The array described in claim 24 (and used in the method of claim 30) have the following elements:

1. A set of nucleic acid probes, the set including a plurality of different nucleic acid probe mixtures that are bound to different regions of a support;
2. Each probe mixture includes an interrogation probe and a partner probe, with the interrogation probes being complementary to a first segment of a reference nucleic acid that contains an interrogation position;
3. Interrogation probes at different regions of the support are identical to one another except at the interrogation position, with interrogation probes at different regions having a different nucleotide base at the interrogation position; and
4. The partner probe is complementary to a second segment of the reference nucleic acid that does not overlap the first segment.

Satoshi does not teach or suggest an array in which there is a set of probes such as recited in current claims 24 and 30. There is no discussion, for instance, of an array in which interrogation probes at different regions are identical to one another except at the interrogation position, with interrogation probes at different regions having a different nucleotide base at the interrogation position. Satoshi thus fails to discuss, for example, at least element 3.

The disclosure in Chetverin fails to compensate for the deficiency in Satoshi. So even when the disclosures of these two references are combined, they fail to teach or suggest each element of claims 24 or 30.

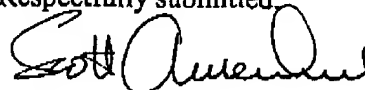
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While no fee is believed due with this response, if a fee is due, the Examiner is authorized to charge deposit account 20-1430 in the amount of such fee.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted



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